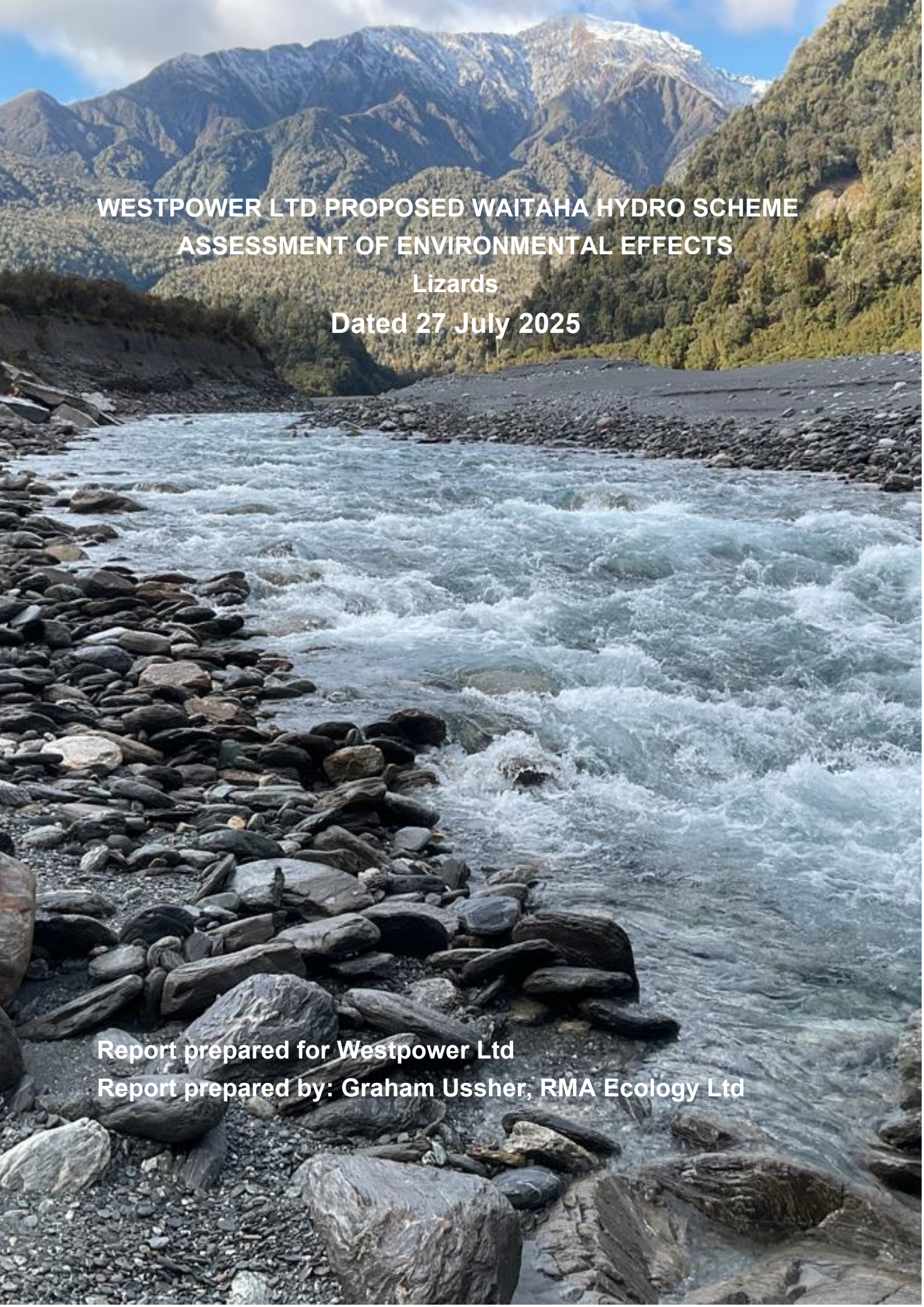

WESTPOWER LTD PROPOSED WAITAHA HYDRO SCHEME
ASSESSMENT OF ENVIRONMENTAL EFFECTS
Lizards
Dated 27 July 2025

Report prepared for Westpower Ltd
Report prepared by: Graham Ussher, RMA Ecology Ltd

Statement confirming compliance with the Environment Court's Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023

As an expert witness or peer reviewer, I have read, and I am familiar with the Environment Court's Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023.

I have prepared my, or provided input into, an assessment of effects for the Waitaha Hydro Scheme in compliance with the Code of Conduct and will continue to comply with it in this Fast-track Approvals Act process. In particular:

- my overriding duty is to assist the decision-maker impartially on matters within my expertise;
- unless I state otherwise, my assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express; and
- I have not, and will not behave as, an advocate for the Applicants.

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1. INTRODUCTION

1.1 Westpower Ltd (**Westpower**) proposes a run-of-the-river hydro-electric power scheme (**Scheme**) for the Waitaha River, approximately 60 km south of Hokitika[1] on the West Coast of the South Island, New Zealand.

1.2 The Scheme would be run-of-river with no instream storage. The proposed Headworks include a low weir and intake structure situated at the top of Morgan Gorge that will divert water into a pressurised tunnel and desander. A pressurised tunnel will convey the diverted water down to a power station below Morgan Gorge. Having passed through the turbines the diverted water will be returned via tailrace discharging to the Waitaha mainstem in the vicinity of the confluence of Alpha Creek. The Scheme is to divert up to a proposed maximum of 23 cumecs, whilst maintaining a minimum residual flow of 3.5 m^3/s immediately downstream of the intake. The hydro design includes a 10 cumec bypass valve to maintain water flow following station outages. The abstraction reach would include approximately 2,500 metres of the Waitaha River, including Morgan Gorge. Construction access to the Headworks above Morgan Gorge would initially be via helicopter and/or on foot and then via a separate access tunnel (once completed), while an access road and transmission line corridor would be required from the Waitaha Valley Road to the Power Station (on average 15m in width). A short access road will provide temporary access between the access tunnel portal at the Headworks and Construction Staging Area 1 during the construction phase which will be rehabilitated on completion. A spoil disposal site and Construction Staging Area 3 (temporary), will be established on the true right of Macgregor Creek on private land outside the margin of the Creek. The land will be rehabilitated to pasture, in accordance with the requirements of, and as part of, the farming operation. The Scheme footprint upriver of Macgregor Creek lies within Department of Conservation (**DOC**) administered land. Further detail on the project design and project background information as it relates to herpetofauna is set out in **Appendix A.** This information, as well as a description of the **Project Site** is set out in the **Project Overview Report.**

1.3 RMA Ecology Ltd has been commissioned by Westpower to assess the potential effects of the Scheme on native lizards (**the Lizard Report**). The qualifications and experience of the author – Dr Graham Ussher - are laid out in **Appendix B** to this report.

1.4 This report considers and assesses the values and the significance of the Project Site in relation to native lizards, the potential effects of the Scheme on native lizards, and how these effects are proposed to be avoided, mitigated or remedied (and where necessary, if more than minor adverse effects remain, how additional effects management measures will address these). The scope and approach of this report is set out in **Appendix C.**

1.5 It concludes that after implementing the recommendations in this report, the effects of the Scheme will be less than minor on native lizards.

2. EXISTING ENVIRONMENT

2.1 The Waitaha Catchment includes the Broomfield and Smythe Ranges, with numerous peaks above 2,100 m. The Scheme is predominantly on the north (true right) side of the Waitaha River

[1] Measured using local roads and tracks to the Power Station Site.

from Macgregor Creek to Kiwi Flat, immediately above Morgan Gorge, approximately 17 km upstream from the SH6 bridge across the Waitaha River.

2.2 The Scheme's proposed footprint lies within both private and public land. Most of the footprint area lies within unmodified indigenous vegetation of the Waitaha Forest Conservation Unit, being Stewardship Land administered by DOC. The proposed activity within this area is predominantly on the north (true right) side of the Waitaha River from Macgregor Creek to Kiwi Flat, above Morgan Gorge (**Figure 1**).

2.3 Vegetation present within the Scheme's footprint and in its surrounds is primarily indigenous, with an increasing exotic plant component moving from the headwater works at the entrance to Morgan Gorge, to the Power Station near Alpha Creek, and through to the spoil disposal area and Construction Staging Area 3 both on established farmland on the true right of Macgregor Creek. The proposed farm track upgrades from Construction Staging Area 3 through to Anderson Road, and the transmission line route from Anderson Road to SH6 support mostly exotic pasture, and the transmission route from SH6 through to the Waitaha Substation supports mostly regenerating native hardwood scrub.

2.4 The principal forest types within the Scheme's footprint below Morgan Gorge are broadly grouped as kamahi forest (establishing, regenerating or mature) and seral forest (also establishing, regenerating or mature), with sub-communities often clearly demarcated by different topography such as above and below terraces, or between alluvial river flats and forest margins. The most northern parts of the Scheme – power transmission lines and spoil / staging area – are within highly modified exotic grassland communities, most of which are managed as grazed pasture.

2.5 The transmission line corridor from Anderson Road through to SH6 and to the existing Waitaha Substation supports indigenous scrubland along parts of the route; however, any vegetation clearance along that route is already covered by existing consents for the maintenance of vegetation beneath existing powerlines, and therefore any effects on potential lizard habitat are not included in this assessment of lizard habitat or covered under this assessment of effects. As such this assessment of effects does not discuss vegetation or potential lizard habitat north of the Anderson Road farm boundary.

2.6 The lizard assessment has considered the Scheme as five geographically distinct parts within the project footprint, which are briefly described below. A more detailed description of these can be found in the vegetation survey report by TACCRA Ltd, 2025, *Waitaha Hydro Scheme: Assessment of environmental effects – Vegetation* (**Vegetation Report**). Representative photos of each site and vegetation units within those sites are presented in **Appendix D**.

(a) Headworks at head of Morgan Gorge - successional hardwood shrubland on the terrace on the true right above Morgan Gorge where a temporary Construction Staging Area 1 and associated road access is proposed (**Figure 2**). The canopy of this area is up to 3 m tall within the eastern and central portion and comprises mostly dense shrubland with a high presence of divaricating species, poor quality understorey, and lacks large woody material. Towards the western part of the area (towards the Headworks and surrounds), the vegetation is older and comprises canopy species (dominated by puka) up to 8 m tall, abundant fallen and standing woody materials/ whole trees, and thick ground cover. Light wells are rare, and well-lit areas are limited to edges on the alluvial terrace over the river.

(a) Power Station (**Figure 3**) – Most of this area is an alluvial terrace and supports grassland with sparse shrubs and trees with underlying gravel fans and river stone accumulations. Much of the area is open and exposed to the sun. The hill foot slopes adjoining the terrace support mature closed-canopy podocarp/hardwood forest.

(b) Access road and transmission line corridor between the Power Station and Macgregor Creek (**Figure 4**) – low outwash river terrace along the route supports kamahi and seral forest up to 10 m tall, with occasional emergent rimu. Forest gaps are few and the canopy is closed. Parts of the terrace support wetlands or poorly draining substrates. Ground cover is impacted significantly by exotic mammalian browsers. The alluvial outwash fans of Macgregor Creek (true left) support a mosaic of toetoe and exotic grasses over gravels, with occasional gorse and native shrub cover (sparse).

(c) Construction Staging Area 3 and spoil disposal area (**Figure 5**) – this approx. 20 ha supports colonising/ pioneering shrub hardwood on the riparian margin (where the access road and transmission line from the Power Station land on the true right of Macgregor Creek), and non-indigenous, partially developed farmland with woody weeds over dominant introduced grasses and broadleaved herbaceous weed species. Both areas overlie alluvial terraces where river stone substrates are exposed and form heaped features amongst thin soils. The river margin shrubland is partially open, while the pasture areas are fully open to the sun.

(d) Transmission line and access road corridor between Macgregor Creek and the northern farm boundary with Anderson Road (**Figure 6**). This route follows an established farm track that is ca. 4 m wide. The track will be upgraded to a 10 m wide track including shoulder and table drain. Vegetation clearance will be mostly exotic pasture grasses on the margins of the existing road. Over one short stretch (ca. 200 m), woody vegetation on either side of the existing road may be cleared up to 1 m wide, although the certainty of this will not be known until detailed design.

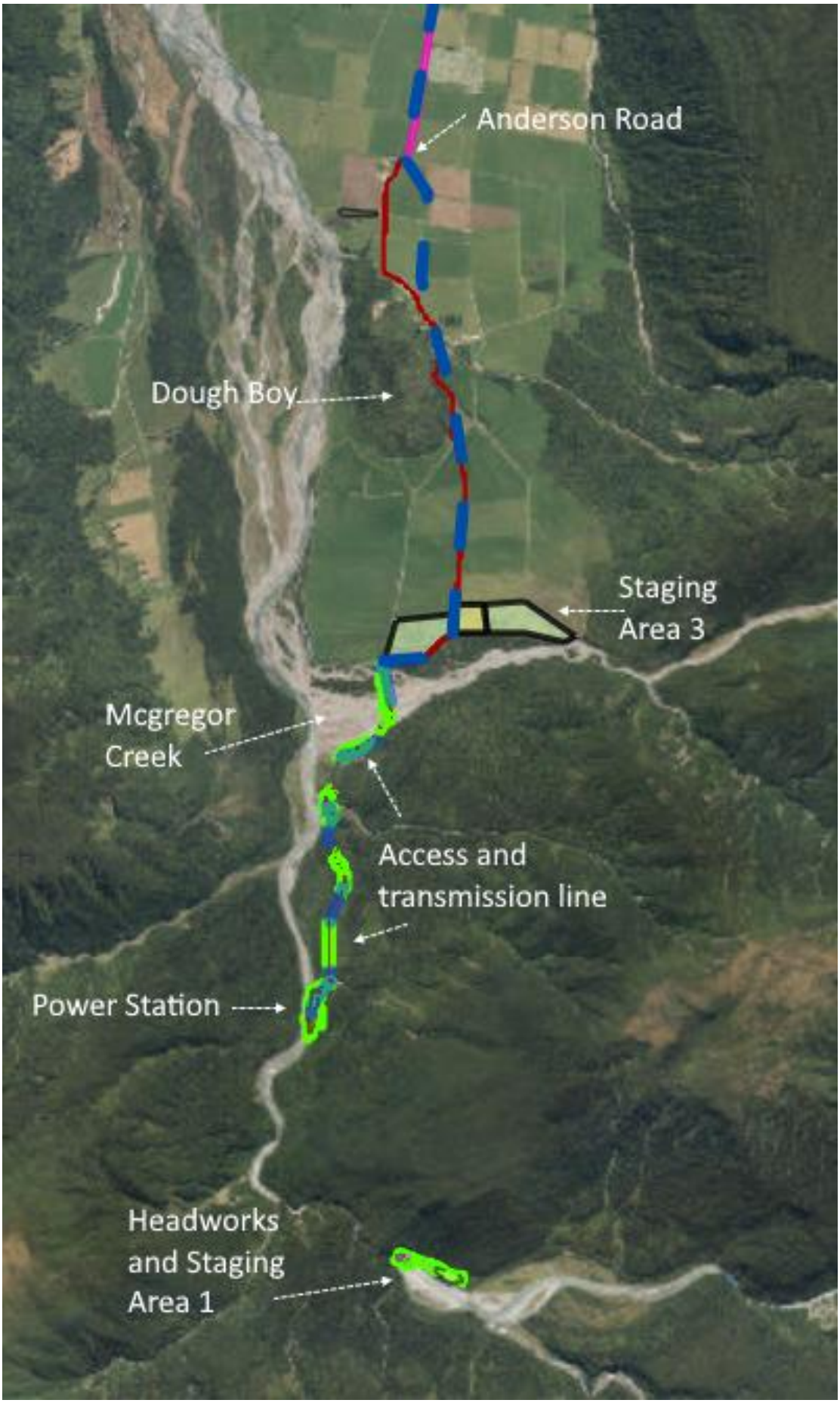

Figure 1. Waitaha scheme, showing key areas referred to in the text.

Figure 2. Headworks general layout, with the temporary access road (grey line) and construction laydown area (green shaded polygon) to the east of the portal as the main features that may support native lizards. The extent of proposed construction disturbance/ vegetation clearance is shown as the hashed green line.

Figure 3. Power Station general layout showing most works located in an open, sparsely wooded alluvial flat. The transmission line and access road corridor (as shown at the top of the figure at Alpha Creek) is within the start of regenerating kamahi forest.

Figure 4. Access road north of Power Station (left image) and portion south of Macgregor Creek (right image). The access road is shown by the red line, with the total disturbance boundary shown by the green dotted line.

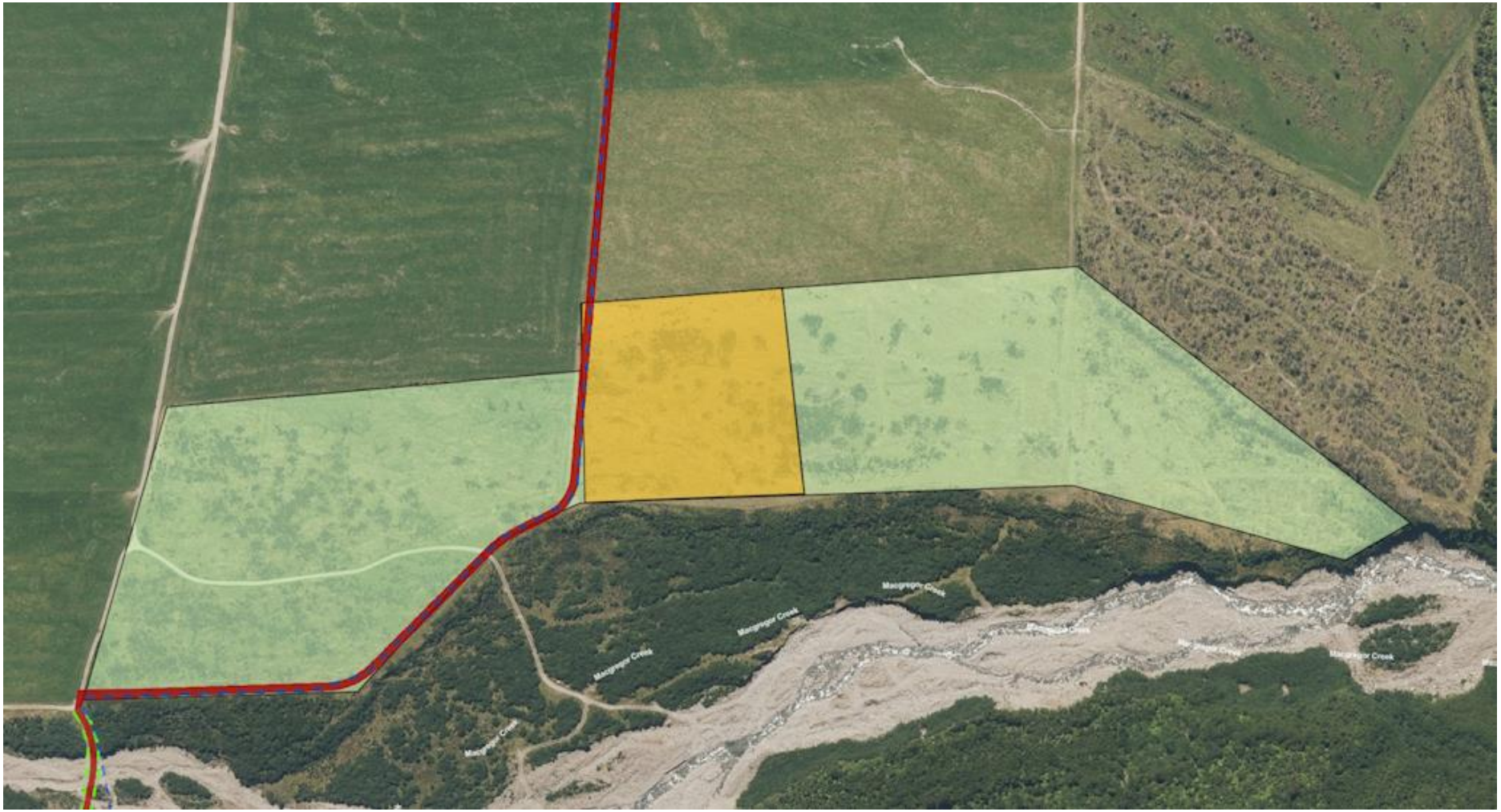

Figure 5. Spoil disposal (shaded green) and construction staging Area 3 (shaded yellow) on the true right bank of Macgregor Creek. The red dotted line is the main access to through the farm to the site.

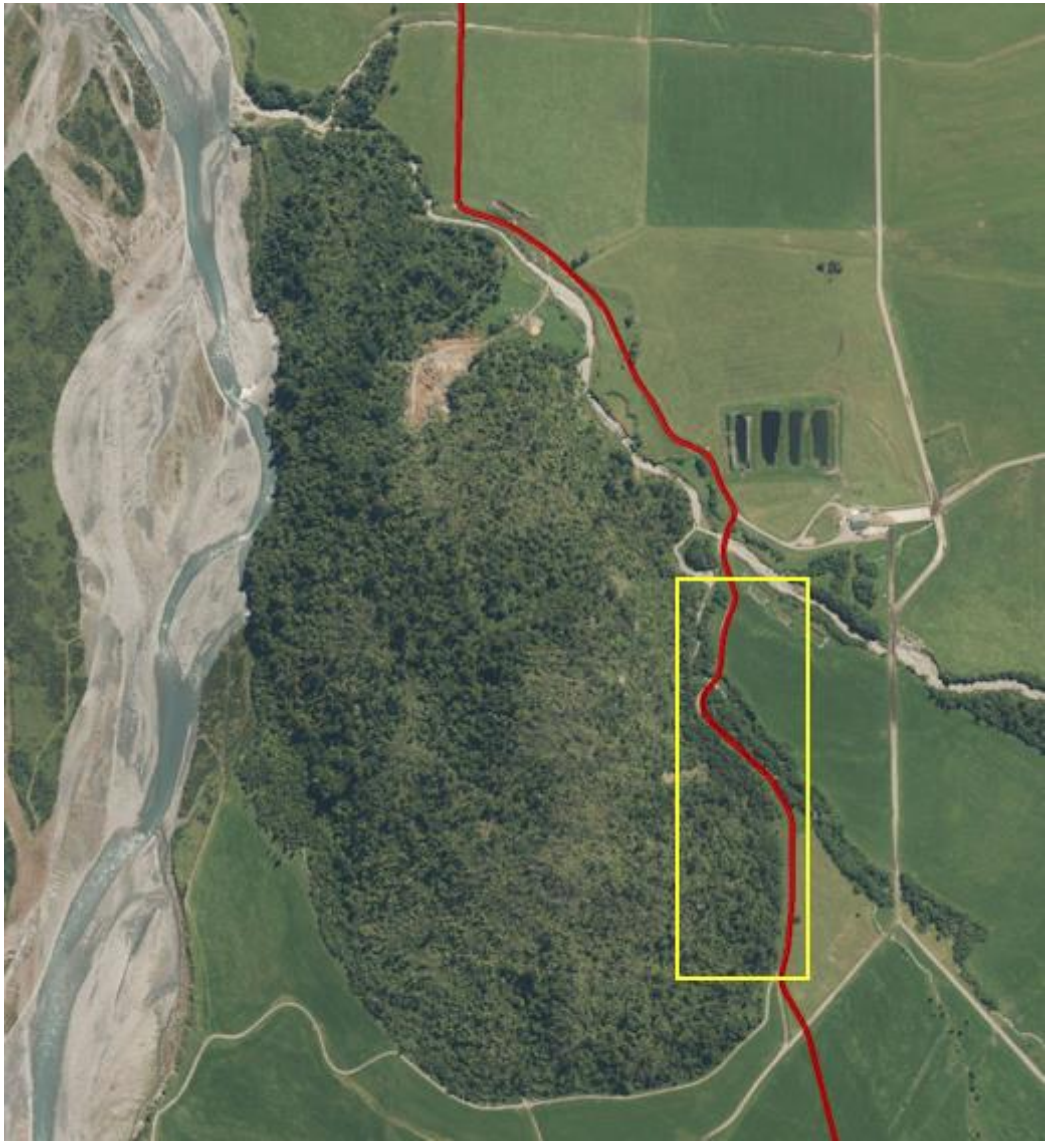

Figure 6. The Doughboy (forested hill) with proposed main access road shown in red, which follows an existing farm road. The upgrade of the road from a 4 m farm track to 8 m wide access track along its current alignment (red line) will involve works within a portion of the eastern side of the Doughboy (generally, the yellow box) and this may require some limited woody vegetation clearance, as well as clearance along the existing rank grass shoulder.

3. INVESTIGATIONS

3.1 Seventeen lizard species (7 geckos, 10 skinks) are currently recognised from the West Coast region (as defined by boundaries of the DOC West Coast/Tai Poutini Conservancy) and there are unverified records of two others, both geckos. Eight species of lizards have been recorded within 20 km of the Project Site, of which three (possibly four) species could be present within the Scheme's footprint. These include forest gecko (*Mokopirirakau granulatus;* At Risk – Declining)*,* West Coast green gecko *(Naultinus tuberculatus;* Threatened - Nationally Vulnerable)*,* northern grass skink *(Oligosoma polychroma*; Not Threatened) and a very small possibility of the Newman's speckled skink (*O. newmani;* At Risk – Declining).

3.2 The investigations for lizards at the Project Site took place over three time periods:

(a) 2013 – survey by Tony Whitaker (Whitaker Consultants Ltd; see **Appendix B**) of two cutover shrubland areas near to (but not within) the project footprint. The survey was undertaken over February 2013 over several days and nights under cool conditions. Methods used included daytime visual encounter survey, manual search of refuges for skinks and geckos, and nighttime spotlighting over multiple nights for active geckos. No sign of lizards, faecal pellets or slough skins were found.

(b) 2024 – survey by RMA Ecology Ltd; see **Appendix C**. A visual and manual search was undertaken in early August 2024 of habitat types, assessment of any changes to vegetation types since 2013, and manual search of terrace river gravel areas around the Power Station Site to look for faecal pellets and slough (2 hr persons search effort through stone piles, under logs, within divaricating shrubs). No sign of lizards, faecal pellets or slough skins were found.

(c) A further survey was undertaken by RMA Ecology Ltd over mid-October (1 week) and mid-December 2024 (1 week) under ideal weather conditions for lizard activity. Areas surveyed were the true left bank of Macgregor Creek adjoining the road access and transmission line route (low shrubland, river margin, cobble fan and terraces), and throughout the proposed staging and spoil storage areas on the true right bank of Macgregor Creek (old terraces, pasture, stone piles). Methods used included daytime visual encounter (basking), ACO refuges, pitfall trapping, gees minnows, and manual search. No sign of lizards, faecal pellets or slough skins were found.

3.3 None of the surveys found signs of lizards – either whole animals, slough or faecal pellets, despite searches over three distinct times, and in areas covering parts of the Project Site and within habitat and vegetation communities that are representative of the habitats within the footprint. The lack of results from surveys within the spoil disposal /staging and Macgregor Creek margin areas provides a high level of certainty about the absence of lizards. If lizards were present in those areas, the suite of methods that we employed, within the active season for lizards, should have detected them. We can state with a high level of certainty that native lizards are not within those areas.

3.4 Discussions with local residents or contractors on the Project site also found that:

(a) The farmer that runs the large farm upon which the proposed disposal and staging areas will be located mentioned that he had last seen lizards last year (2023) on the ground at the farm but, could not pinpoint where (except that it was not within the disposal and staging area location). He could not confirm whether he had seen native, exotic, skink, or gecko species.

(b) Contractors working for Westland Schist Ltd which obtain rock from the Waitaha River and a tributary bordering the proposed footprint, mentioned (2024) that they had not seen any lizards in the 30+ years they had been working there. Their activities included work around the margins of rivers and streams where day-active and heliophilic lizards would be expected to reside, bask, and take refuge under rock, if present, and would be obvious to those working extensively around river margins, as this contractor does.

3.5 Despite finding no lizards over two separate surveys by two separate groups of herpetologists, our opinion is that there is a moderate likelihood of native lizards being present within the Project Site given the large, geographically spread-out distribution of the footprint across multiple habitat types (pasture, gravel, shrubland, riparian edge, forest) and landforms (alluvial fan, terrace, slips, young and old landforms). This is based on the quality of habitat for native lizards and the general findings from studies or surveys elsewhere around the West Coast that have found that detecting native lizards within shrubland and tall forest on the West Coast is extremely difficult.

3.6 That no lizards were found despite intensive search effort over parts of the site indicates that lizards are either locally absent or present in very low numbers and are most likely sparse throughout the footprint, if indeed and are present. The lack of specific survey across parts of the Project Site (e.g. Power Station Site during summer, and forest areas along the footprint) does not infer that a different conclusion could be reached with more surveying – simply because it is expected that lizards would be detected if they were in reasonable population health through the catchment. Given what is widely known about their cryptic nature, low densities, and difficulty of detection with standard survey techniques in the West Coast forest areas, this expectation remains.

3.7 The area of potential lizard habitat affected by the Scheme is small relative to the abundance of habitat within the Waitaha catchment and locally within other catchments. The total potential lizard occupied habitat comprises 6.8 ha across the Headworks, Power Station, and access/transmission route through to Macgregor Creek, and transmission line route and access road upgrade at the Doughboy through to Anderson Road. No lizards were found at the staging/spoil disposal area (20 ha). Post-construction, permanent vegetation loss will be 4.5 ha, as 2.3 ha of cleared vegetation will be re-vegetated or allowed to naturally re-establish following completion of the construction works.

4. VALUES AND SIGNIFICANCE ASSESSMENT

4.1 If lizards are present within the shrubland and forest areas of the Scheme footprint (which is possible (moderate likelihood)), the species most likely to be present will be forest gecko and West Coast green gecko. Both species have a conservation threat status. Loss of individuals of either species would be barely measurable across their distribution, as both species populations have wide, known distributions. The same is true for northern grass skink, which may be present in open, grass areas, and for Newman's skink. Compared to the gecko species and grass skink, there is a very small chance Newman's skink is present in the habitat of the Scheme area. However, it has similar gross habitat needs as grass skink so this cannot be completely discounted. Given the declining conservation trend for these species (as with other NZ reptiles), any loss would be important to avoid. It is unlikely that loss of individuals along the proposed footprint would be of a scale to qualify as 'significant' in ecological terms; any such loss would constitute a minor adverse effect.

4.2 Although the quality of vegetation communities south of Macgregor Creek is high, the value of these communities to lizards is considered to be moderate because most are young communities that lack

lizard habitat complexity, and all are subject to the uncontrolled impacts of introduced mammalian predators. The Power Station Site and access road and transmission corridor to Macgregor Creek and through to Anderson Road are also subject to grazing pressures which have simplified habitats and reduced habitat quality for lizards. Overall, the values of the habitats south of Macgregor Creek (transmission route, Power Station and Headworks areas) and along small parts of the access road upgrade and transmission line route by the Doughboy would qualify as 'moderate' if these lizard species were present.

4.3 In terms of significance of these areas to lizards, the criteria for assessing ecological significance in the West Coast Regional Council (**WCRC**) Regional Policy Statement (**RPS**), and Westland District Council (**WDP**) District Plan include a criterion for 'Rarity'. That criterion states that if a species that is 'Threatened' within the ecological district or nationally (WDP), or a site contains indigenous vegetation that supports a species that is 'Threatened', 'At Risk' or 'Uncommon' nationally or within the ecological district (RPS), then the vegetation is significant under the RMA 1991. While studies have not found any lizards, as West Coast green gecko is nationally threatened and may be present within parts of the Project Site, that infers that vegetation within the site that could support this gecko, or which may support forest gecko, should be considered significant (although the quality of that vegetation as habitat for these species is considered by us to be of moderate ecological quality).

5. ENVIRONMENTAL EFFECTS ASSESSMENT

5.1 An assessment of actual and potential effects on lizards has been prepared utilising past experience, literature reviews, RMA guidelines and the Ecological Impact Assessment guideline document, published by EIANZ[2] (2018).

5.2 The magnitude of loss of potential lizard habitat is exceptionally small (6.8 ha of clearance and 4.5 ha of permanent loss) compared to the level of similar habitat available locally, and would qualify as a 'very low' level of loss. For the moderate values of the potential habitat, high values of the lizard species that may be within them, and very low level of magnitude of effect of vegetation clearance, the overall level of effect on lizard species from the Scheme is considered to be low, which equates to a **less than minor** effect under the RMA.

5.3 All native New Zealand lizards are protected under the Wildlife Act, and an Authority under that Act is normally required to salvage and relocate native lizards in order to prevent incidental injury or death, such as through habitat clearance (such authorities are being sought as part of the Scheme's fast-track application). Although no lizards have been recorded from the Project Site, it is appropriate to take measures to minimise the potential risk of incidental injury or death to native lizards which are set out in the Lizard Management Plan.

6. ADVERSE EFFECTS MANAGEMENT RECOMMENDED

6.1 Management initiatives that will be undertaken to minimise the risk of incidental injury or death to native lizards at the Project Site (which are all detailed in the Lizard Management Plan) include:

(a) Obtain a Wildlife Act Authority to relocate native lizards from the footprint (such authorities are being sought as part of the Scheme's fast-track application); and

[2] Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. 2018. Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

(b) Undertake a clearance salvage (manual and machine-assisted search) of the Power Station Site immediately prior to vegetation clearance.; and

(c) Undertake a daytime search prior to vegetation clearance within the shrubland at the Headworks, access road and transmission line corridor between the Power Station and Macgregor Creek, and along the Doughboy works (manual day-time search); and

(d) Preferentially placing felled vegetation to one side of the clearance area (where practicable) for the duration of the construction works, so that any lizards within can escape to adjoining vegetation outside of the footprint; and

(e) Re-use felled vegetation (where practicable) to distribute it over cleared areas to assist with rehabilitation (as dead wood and slash piles provide habitat for lizards).

6.2 Further detail of the proposed management for the Scheme's adverse effects is provided in **Appendix A** and is summarised in **Table 1** below. Details of the salvage effort required are contained within the Lizard Management Plan, separate to this effects assessment.

7. CONCLUSION

7.1 Surveys of the Scheme Project Site for native lizards found none, despite there being moderate quality habitat across the site. The cryptic nature of the possible 2-3 species that could be present at the site, together with the probable very low numbers even if present, and partial survey of the site during optimal periods of lizard activity, means that a precautionary approach should assume that there is a moderate likelihood that some lizards are potentially present, with candidate species being grass skink, forest gecko and West Coast green gecko.

7.2 The potential presence of these lizard species means that indigenous vegetation over the Project Site meets the criteria under Section 6(c) of the RMA as significant vegetation. The level of habitat clearance, together with the wide range of these species in the surrounding landscape, means that the permanent loss of 4.5 ha of habitat as a result of the Scheme will amount to a low level of ecological effect, which equates to a **less than minor** effect under the RMA.

7.3 Good practice mitigation should be applied to avoid and minimise adverse effects on native lizards that may be present as set out in the Lizard Management Plan.

7.4 Overall, if the initiatives in this Lizard Report for lizard salvage, vegetation clearance, and habitat rehabilitation are implemented, the level of residual adverse effect of the Scheme will be less than minor.

7.5 During the construction and operation of the Scheme, Westpower has discussed with DOC a contribution to an ecosystem programme in the region managing the effects of this project. If either of these initiates eventuate, it is likely that greater conservation benefits will be delivered for native lizards such that a net-benefit outcome will result.

Table 1 - Environmental effects on native lizards associated with each phase of the Scheme (construction and operational), the suggested approaches to manage these effects, and effects after management measures have been applied.

Scheme phase	Environmental effects (positive and adverse effects)	Assessment of effects	Recommended effects management	Residual effects post-mitigation
Construction effects	Loss of potential habitat for arboreal geckos (forest gecko and West Coast green gecko) [negative]	Less than minor	Remediation – rehabilitate temporary clearance areas after construction to ensure that tree and shrub species re-establish. Requires the development of a site vegetation management plan within which lizard habitat creation is specifically addressed.	Negligible – deficit of habitat permanently cleared compared to replanted; quality of remediated habitat is expected to improve for lizards over time.
	Loss of potential habitat for ground-dwelling skinks (grass skink) and Newman's speckled skink [negative]	Less than minor	Remediation – rehabilitate temporary clearance areas after construction to ensure that rocklands and grasslands favoured by ground-dwelling skinks are re-established. Requires the development of a site vegetation management plan within which lizard habitat creation is specifically addressed.	Negligible – deficit of habitat permanently cleared compared to replanted; quality of remediated habitat is expected to improve for lizards over time.
	Potential for injury or death to native lizards with vegetation clearance [negative]	Minor	Mitigation – 1) pre-clearance salvage within Power Station Site, Headworks, access road and transmission line corridor through to Macgregor Creek, and works around the Doughboy to include manual search, and day-time search, 2) keep cut vegetation on site as far as possible – move into adjoining areas or store for post-works rehabilitation	Less than minor
Operational effects	Permanent loss of potential lizard habitat occupied by project structures [negative]	Less than minor	None	Overall, permanent residual effects after the above mitigation and rehabilitation are expected to be less than minor

	A contribution to an ecosystem programme in the region during construction and operation [positive]	Net benefit	AA contribution for a ten-year period to an ecosystem programme in the region commencing on construction and extending to the life of the consents.	A contribution to an ecosystem programme commencing on construction and for the life of the consents will likely create a net-benefit gain for lizards (as well as other wildlife) that will at least balance any overall net negative effects (albeit negligible – less than minor impacts) of the development on native lizards in the Project Site.

APPENDIX A - FURTHER DETAIL ON THE PROJECT DESIGN AND PROJECT BACKGROUND INFORMATION AS IT RELATES TO NATIVE LIZARDS

The Scheme

- Is a run-of-river design and has been chosen to avoid the need to develop large-scale dam structures, impoundment and water storage lakes.
- Diverts up to a maximum of 23 m³/s (cumecs).
- Retains a residual (minimum) river flow of 3.5 m³/s.
- Has an abstraction reach (intake weir to tailrace) approximately 2.5 km long.
- The layout will develop about 105 m of head.
- Generates an annual output of ~120-140 GWh with a peak output of 23 MW of power.
- Has a 10-cumec bypass valve to maintain water flow following emergency station outages.
- No works occur within existing reserves.

- The operational footprint encompasses project areas between the Waitaha substation and the Headworks:
  - In the area between the farm boundary at Anderson Road and the Headworks, more than 90% is made up of the road and transmission lines. The remaining footprint is spread over two distinct and discrete areas, the Headworks and the Power Station Sites.
  - Designed to minimise the footprint and potential effect on the environment within which it is located.
  - From the farm boundary at Anderson Road there is approximately 12.6 km of existing transmission line which continues via the Waitaha Road to SH6, along SH6, and then follows Bold Head Road to the connection with Westpower network. It is noted that the line will be upgraded at the beginning of Waitaha Road, along SH6 and along Bold Head Road, and a new 66 kV line will be built along the Waitaha Road (except the beginning) all the way to the Power Station.

Pre-construction activities include:

Investigative geotechnical drilling for tunnel construction (which may occur under a separate concession if the work needs to start before Westpower's fast-track application is decided). This will involve drilling rigs and possibly camp sites at six vertical locations and one horizontal drilling location from the surface, with multiple boreholes drilled from each entry point.

Approximate size of disturbance areas:

- drill site 10 x 10 m (note: helicopter landing is not required at the drill site),
- two helipads 10 x 12 m (near each campsite described below),
- emergency hut (if no camp) 3 x 4 m,
- two campsites – at locations that will later become Construction Staging Area 1 and Construction Staging Area 2: camp 10 x 10 m; generator 3 x 4 m; drying room 3 x 4 m,

portable toilet 3 x 3 m; shower 3 x 3 m; there will be holding tanks used for shower and toilet water collection

- pump site at closest water supply 3 x 3 m

- The area of indigenous vegetation potentially affected between the Waitaha Substation and the power station site, and at the headworks, during construction will be approximately 6.8 ha (incl. 0.7 ha riparian), which will be reduced through rehabilitation and regeneration to approximately 4.5 ha during the operational phase.
- All areas not required for the ongoing maintenance or operation of the Scheme will be rehabilitated.

See the Project Description for further details on the areas of potential lizard habitat

- Headworks
- Power Station
- Access road from Power Station to Macgregor Creek
- Spoil and Construction Staging Area 3
- Access road from Spoil and Construction Staging Area 3 to Anderson Road (works to clear vegetation around the Doughboy)

APPENDIX B – GRAHAM USSHER – QUALIFICATIONS AND EXPERIENCE

rma ecology

Dr Graham Ussher – Principal Ecologist/ Director

Graham has more than 30 years experience with government agencies and the commercial sector assessing biodiversity and biosecurity issues. He brings a multi-disciplinary approach to ecological monitoring and assessment, strategy development and implementation, and project design and management.

Through his involvement with resource developers, local government and government agencies, he is a recognised leader in New Zealand in the field of ecological effects management – including offsetting and ecological compensation - incorporating ecological risk assessment with detailed project engineering design. Graham regularly presents expert evidence on these matters to local hearings, Boards of Inquiry and the Environment Court.

Qualifications

- PhD (Environmental Management), University of Auckland, NZ.
- MSc (Conservation Ecology) and BSc, UoA, NZ.

Statutory hearing / Court experience

- **Council hearings**: 30
- **Environment Court**: 4 (plus 6 mediations)
- **Boards of Inquiry**: 1
- **Fast Track (COVID & FTA)** 3

Employment History

- 2016 – Principal Ecologist, RMA Ecology Ltd.
- 2007 – 2016 Principal Ecologist; Tonkin & Taylor Ltd, Auckland.
- 2004 – 2007 Regional Ecologist; Auckland Council.
- 2001 – 2004 Lecturer in Environmental Management; University of Auckland.
- 1995 – 2004 Independent ecological consultant.

Expertise

Core competencies include:

- Ecological survey and effects assessment.
- Stream ecological assessments (incl. SEV).
- Specialist lizard survey and salvage/ relocation.
- Project design ecological risk and cost estimation.
- Mitigation and offset compensation development, including brokering packages with regulators.
- Science advisor for biodiversity offset programmes in industry and government (nationally recognised expert in offset brokering).

Over his 30 years in industry, Graham has focused on work where development is most likely – greenfields areas, lowland shrublands and forests, coastal environments, and environments already modified in terms of wildlife habitat. His past experience in wildlife research, Council parklands management and wildlife programmes with the Department of Conservation required work in wilderness and offshore island locations, providing a robust benchmark against which to assess effects in more modified land proposed for active development.

A common thread running his project experience is a deep involvement with the RMA, particularly in the areas of significance assessments, effects assessments (s88) and more recently, s104 assessments involving ecological offsetting. Over the last 19 years Graham has worked increasingly closer with planners and lawyers so that project-specific designs accurately reflect up-front ecological risk, potential offsetting or compensation needs (and costs), and so that consentable solutions provide ecological benefits as well as achieving desired development outcomes.

Graham has worked for many years with multi-disciplinary teams on projects across New Zealand. From this he has a robust understanding of civil construction processes and engineering design for flood, stormwater, and wastewater management, and a base understanding of issues involved with land development, mining and quarrying sectors, resource management planning, civil engineering, renewables (wind, solar, hydro) and contaminated land management.

In recent years, Graham has been sought out for his experience in effects management theory, processes

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and practical application. He has presented on matters of the effects management hierarchy and offsetting to professional bodies including the Planning Institute, Law societies, and to the Environment Court. He has written or co-written national guidance on ecological effects assessment in New Zealand, as well as national guidance on biodiversity offsetting and compensation frameworks as applied under the RMA.

Experience

Examples of relevant projects:

- **Lee River Dam, Nelson, Waimea Water Augmentation Committee/Tasman District Council/ Waimea Water, 2008-ongoing**
  Ecological effects project manager/ ecological specialist for the ecological AEE, including consultation, sub-contractor management, effects assessment, development of mitigation and offset design with key stakeholders (DOC, iwi, public groups), expert at Council hearing and mediation for the Environment Court appeal. Preparation of biodiversity mitigation management plans as required by consent conditions. Ecology technical advisor to TDC on matters post-consent. Undertook cost analysis and costing for environmental components of the dam for Waimea Water (2017). Prepared Vegetation Clearance Plan for consent holders. Senior ecologist advising the consent holder and construction contractor during the 4-year build phase for the dam (2019 onwards).
- **National guidance on biodiversity offsetting; NZ Transport Agency; 2016-2017.** Lead author and researcher for the development of national guidance to the Agency on the application of biodiversity offsetting to roading projects in New Zealand.
- **Local Government guidance on biodiversity offsetting; 2017.** Ecology technical advisor as part of 5-specialist, multi-disciplinary team that prepared national guidance on biodiversity offsetting and ecological compensation for the Regional Bio-managers Group. Co-presenter on 14-city national road show to socialise Guidance amongst regulators and practitioners.
- **Expert advisor to NZ Transport Agency** (2014-ongoing) on biodiversity matters during Auckland Unitary Plan hearings, including SEAs and significance criteria for assessing site values.
- **Auranga Housing development, South Auckland. Karaka and Drury Consultant Ltd. 2015 – ongoing**. Assessment of ecological values and potential effects for a 160 ha, 3,000 lot Special Housing Area/ Plan Change subdivision in rural/ residential land in Papakura, South Auckland. Work includes the mapping of streams & wetlands, vegetation, and coastal values, and development of mitigation and ecological compensation plans where potential effects cannot be avoided. Expert at hearings. Project ecologist dealing with all matters raised by Council through the development administrative process. Project ecologist implementing construction management, wildlife salvage/ relocation, and ecological restoration arising from consents.
- **Milldale Housing development (Auckland). 2018-ongoing.** Lead ecologist for this 200 ha / 2,500-lot subdivision, dealing with values and effects assessment, offsetting requirements, expert for consenting process, and implementation of ecological parts of granted consents (staged development).
- **Auckland housing development projects. 2015 – present.** Lead ecologist for baseline ecological values assessments, assessments of effects, mitigation and compensation programme development, expert representation for clients at Council hearings and development of site ecological management and planting plans (where necessary). Project involvement includes substantial subdivisions such as:

  Chin Hill (Hatfield's Beach), Auranga A (Drury), Auranga B (Drury), Oraha Rd SHA, Bollard Av SHA (Mt Albert), Oakland Road (Hingaia), McRobbie Road (Kingseat), Kingseat Hospital site (Kingseat), Stables Retirement Village (Drury), Mangere HNZ/HCL State Housing Redevelopment Project.
- **Hunua Quarry, Winstone Aggregates, 2007 - ongoing**
  Project manager for mitigation programme development and implementation, expert witness, and project manager for ecological monitoring projects of the $70M Symonds Hill pit development project. Includes substantial annual lead for ecological programmes to salvage wildlife, monitor planting success, report on KPIs and manage consent deliverables on behalf of GBC Winstone for Hunua Quarry.
- **Ecological assessments, AEEs, technical reporting, input into conditions of consent – for at least 250 projects.**
- **Various revegetation and biodiversity management plans as part of consented land development and infrastructure works (at least 150 projects),** including revegetation of shrubland and forest plant communities, rare species inclusion in planting plans, managing site risks and constraints for plant community persistence, lizard relocation, fish salvage, fish passage and stream diversion design. Sectors include Auckland coastal property rehabilitations, commercial developments, subdivisions, infrastructure and industrial site rehabilitations. Outside Auckland projects include major hydro and irrigation/ water supply dams, national highways, wind farms, port development, quarries and mines, and landfills (new and rehabilitation).

Relevant project involvement (2016 to present)

Large scale projects

- Ecological effects advisor to Oceana Gold (NZ) for Macrae's Gold Mine expansion (Deepdell North III)
- Auranga Housing Development – ecological assessment, expert witness, construction contractor
- Milldale Housing Development – ecological assessment, expert witness, construction contractor
- Hunua Quarry Symonds Hill Pit – ecological assessment, expert witness, construction salvage/ monitoring
- Ecological effects advisor to Oceana Gold (NZ) for Waihi Gold Mine expansions (several parts)
- Waimea Community Dam - ecological assessment, expert witness, offset design, salvage/ monitoring
- Te Kuha Coal Mine – expert reviewer on behalf of Council; expert for Env Court appeal
- Mt Cass Wind Farm (Christchurch) – project ecologist managing construction monitoring & regulator liaison, lizard and rare plant salvage (extensive), monitoring, reporting, ecological offset modelling, science advisory
- Wongan Farms, Kaitorete Spit. Project ecologist for 1,000 ha farm development for selected irrigation & rare plant/ ecosystem restoration and preservation, effects assessments, monitoring designs, compliance reporting
- Kapiti Coast Airport site re-development – lead ecologist.
- Genesis Energy – Tekapo Power Scheme Re-consenting. Project herpetologist.
- Stevenson Quarries – Clevedon Quarry consenting; expert advisor to Env Court cases regarding AUP zoning
- Wellington region – 200 ha confidential subdivision with considerable ecological issues
- Auckland Plan Change 40 – technical advisor regarding effects management strategies, offset risk & cost.

Small scale projects

- Lyttleton Port Company – ecological assessment for Gollan's Bay Quarry reactivation & lizard salvage
- Land development projects (effects assessment, management plans, specialist offset, or inputs into consenting)
    - Auckland - approximately 100 projects
    - Wellington - approximately 60 projects
    - Elsewhere North Island – approximately 40 projects
    - Elsewhere South Island - approximately 35 projects

Technical advice only

- Nelson Plan – policy analysis and advice regarding Esplanade Reserve setbacks
- NZTA – lead for preparation of national guidance on biodiversity offsetting
- LGNZ – senior author on national guidance on offsetting under the RMA
- Department of Conservation – 18-month secondment to biodiversity offsetting research programme
- Auckland Council – Otara Inlet restoration master planning group (ecology technical expert)
- Auckland Council – expert advisor on offsetting for Watercare Services Huia Water Treatment Plan consent
- Electricity Generators Group – technical review of matters arising from the draft NPS Indigenous Biodiversity
- Wellington Regional Council – technical advice via workshop to across-Council team (legal, policy, planning, ecology, consenting) regarding biodiversity offsetting in practice relative to regional plan provisions.

- 30 years' experience surveying reptiles and frogs in NZ, including for DOC, Councils, and commercial developers.
- Qualifications: PhD (conservation ecology) University of Auckland.
- Affiliations/ membership; SRARNZ, NZ Eco Society, EIANZ.

Previous and current Authorities held:

- Auckland Region: DOC file ref NHS 02-28-03; Permit number AK-13724 FAU; and DOC permit 37031 FAU NHS-12-03, 47967 FAU and 78350- FAU. Current regional Authority for Auckland is 101814- FAU (about to be renewed as 119558-FAU)
- Wellington/ Nelson Region: survey only 91417-FAU; renewed as 117825-FAU
- Canterbury region - survey permit 117740-FAU
- West Coast region – survey permit 117742-FAU
- Hawkes Bay - survey permit – pending (being processed)
- Nelson/ Marlborough region – survey permit 117824-FAU
- Wellington salvage: 91371-FAU
- Tasman (Pohara) salvage: 97668-FAU
- Mt Cass windfarm: multi-programme salvage: 81670-FAU and 86276-FAU
- Mackenzie Basin survey: 91677-FAU

Experience summary:

- Project manager & field lead for tuatara translocations to Whale Island (1996), Tiritiri Matangi (2003) and Motuihe Islands (2012).
- Lizard island surveyor (on contract) for DOC Auckland (1993 – 2000) undertaking spotlight, pitfall, ACO surveys of rare and threatened lizards on Mercury Islands, Alderman Islands, Hen & Chickens Islands and other outer Hauraki Gulf islands.
- Undertook lizard surveys in Otago, Canterbury (Mt Cass wind farm) and MacKenzie Basin sites for windfarm and irrigation projects during 2003-2007.
- Currently managing major lizard survey, salvage, relocation, post-release monitoring and research programmes at sites in Christchurch (Mt Cass wind farm) and Wellington (various land development projects).
- Graham has undertaken approx. 70 other survey, salvage, rescue/relocations on private property from 2007 – 2025 across New Zealand.
- Graham has prepared more than 50 lizard management plans for consented development projects and has undertaken salvage works for most of those (some consented developments have not gone ahead).

APPENDIX C – LIZARD SURVEY REPORT (RMA ECOLOGY LTD)

1. INTRODUCTION AND SCOPE

1.0 RMA Ecology Ltd has been commissioned by Westpower Ltd (**Westpower**) to assess the potential effects of the Waitaha Hydro Scheme (the **Scheme**) on native lizards. The scope of our brief was to review previous work undertaken by others on lizards for the Scheme, undertake additional surveys within areas of the Scheme's footprint added since the last lizard assessment in 2013, and to provide an assessment of potential effects on native lizards from the construction and operation of the Scheme.

2. PREVIOUS LIZARD SURVEY

2.1 An assessment of lizards across the Scheme (as it was designed) in 2013 was undertaken by Tony Whitaker (Whitaker Consultants Ltd, available at this link: Microsoft Word - WCL Waitaha report - Final final - 12 August 2013.docx).

2.2 That work involved a literature review of the lizard fauna of the local area, an assessment of lizard conservation and habitat values, and a limited survey for lizards.

2.3 The areas surveyed on the ground for lizards by Whitaker Consultants Ltd were located within high-quality lizard habitat to the north and south of the Scheme footprint (**Figure B1**). No survey for lizards was undertaken within the Scheme footprint itself, although extensive comment was made on the quality of habitat within the Scheme footprint, and inference was made from the results of ground survey work on the possibility of lizards being present within the Scheme footprint.

2.4 Methods used and timing of the Whitaker survey in 2013 followed best practice and included manual search, basking lizard search, and night spotlighting, all in February, which is within the active season for lizards.

2.5 The survey did not find any sign of lizards at any of the sites surveyed. Potential species that were assessed as possibly being present were West Coast green gecko, forest gecko, and grass skink.

2.6 The quality of habitat assessed for lizards at the sites surveyed was considered to be excellent quality by Whitaker. Despite the lack of sign of lizards, Whitaker concluded that forest gecko was 'unquestionably present', and West Coast green gecko was 'highly likely' to be present throughout shrubland and forest areas over much of the Scheme footprint. He also considered that grass skink was 'highly likely' to be present, albeit in very localised areas of the Scheme footprint within old flood channel, flood-plains, riparian margins and slip margins (such as the margins of the Headworks laydown area, Powerhouse area, and margins of Macgregor Creek).

3. RMA ECOLOGY SURVEY – METHODS AND TIMING

3.1 The lizard assessment undertaken by RMA Ecology involved two parts – one during August 2024 and one during October/ December 2024.

3.2 The August 2024 assessment was undertaken when lizards were not expected to be active. The purpose of the assessment was to walk the entire Scheme footprint from the Headworks through to the spoil disposal/construction staging areas at Macgregor Creek, determine if habitat for lizards

had changed in those areas since the previous survey in 2013 (it has not), and to undertake targeted searches for sign of lizards.

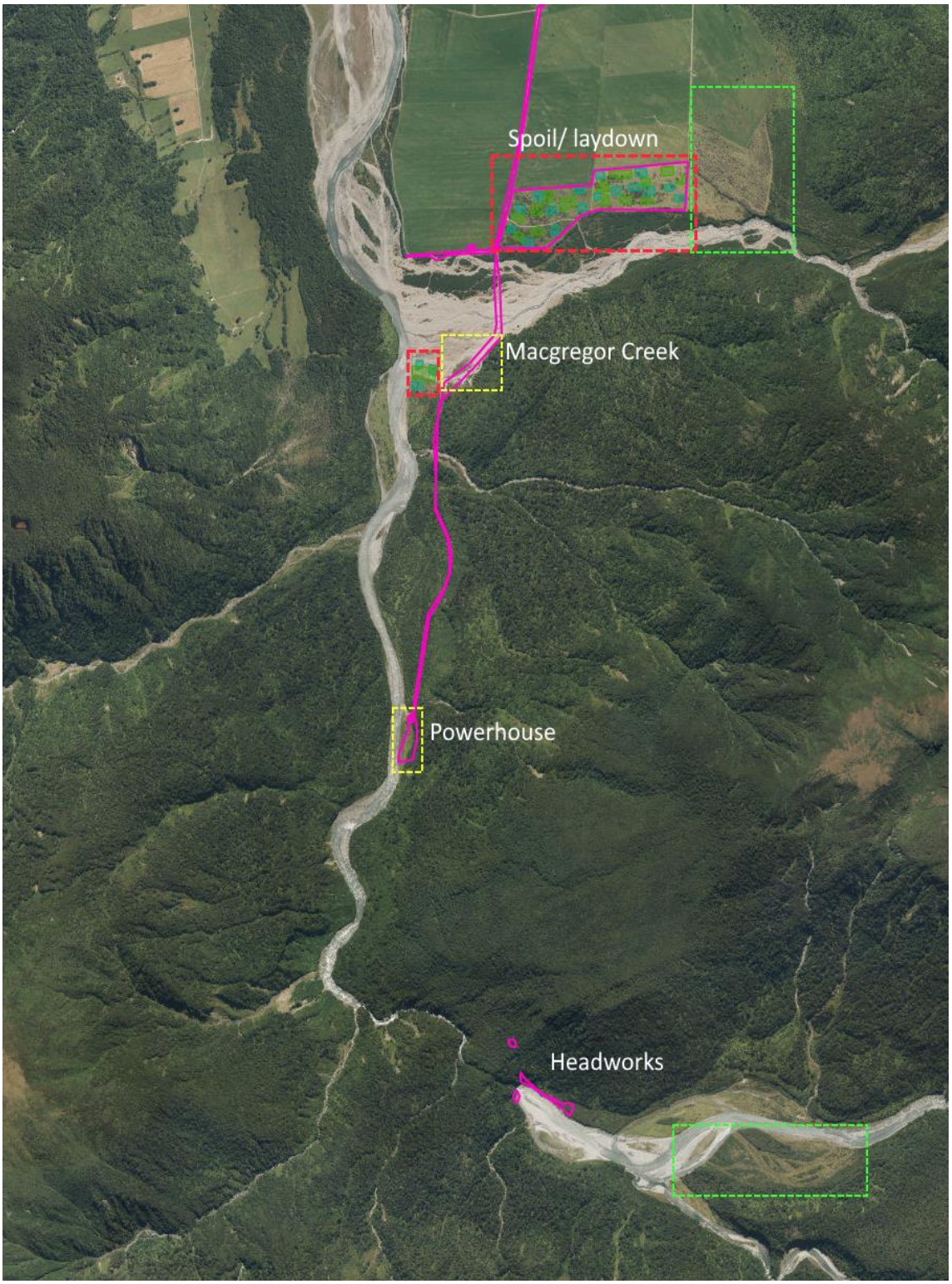


Figure B1. Scheme footprint (purple polygons) with search locations for lizards. Search areas by Whitaker in 2013 (green boxes denote general areas, see Appendix D for actual areas) focussed on shrubland and forest edge for arboreal geckos. Areas searched by RMA Ecology in August 2024 (yellow boxes) focussed on river terrace habitat, while areas surveyed in October/ December 2024 focused on river terrace and rough pasture/ cobble areas (red boxes). Absence of yellow, red or green boxes means that lizard survey was not conducted over that location. The road access and transmission line routes from the Spoil/ Construction Staging area 3

through to the Waitaha Substation was also not surveyed for lizards, as any vegetation clearance would be undertaken under existing consent and permits.

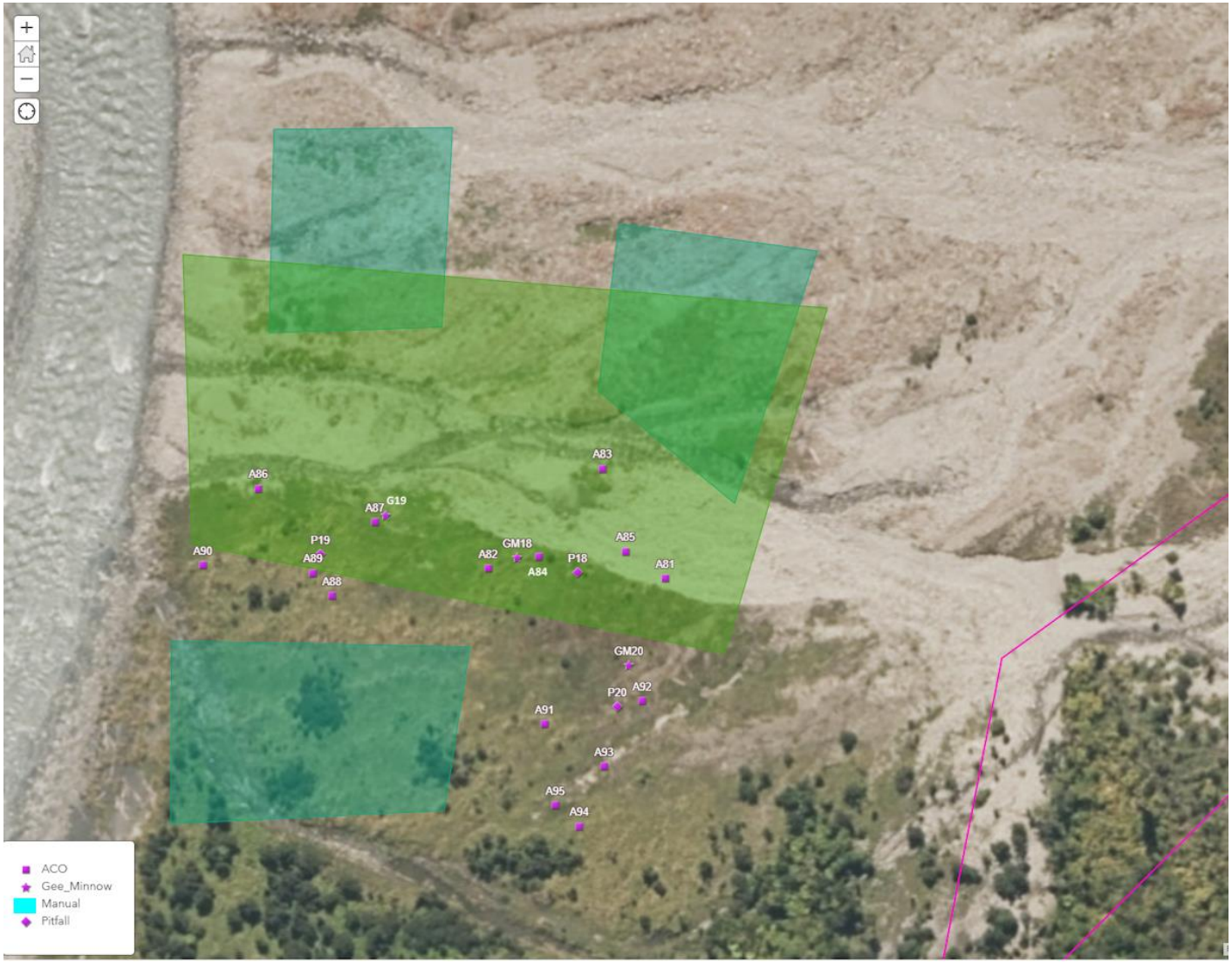


Figure B2a. Macgregor Creek true left bank area that was assessed for lizards over October/ December 2024. Symbols denote the method applied, with clusters of ACOs, pitfalls and gee minnow traps. Manual search (basking visual assessment, and cover object search) were conducted over the larger turquoise/ light green areas. The Scheme footprint is shown in purple linework to the right of the search areas; the Scheme footprint was avoided in this location to avoid unintended impacts on Public Conservation Land.

Figure B2b. Spoil disposal/staging area that was assessed for lizards over October/ December 2024. Symbols denote method applied, with clusters of ACOs, pitfalls and gee minnow traps across multiple locations. Manual search (basking visual assessment, and cover object search) were conducted over the larger turquoise/ light green areas. The boundary of the Scheme footprint is shown in purple linework.

3.3 Targeted searches of lizards were undertaken at the Power Station site, and along the margins of Macgregor Creek near to where the access road and transmission line is proposed to cross. No sign was found of lizards despite cobble, rock and woody material/ log habitat in those areas being high quality for grass skink (and other heliothermic lizards, if present). Despite the searches taking place in August when lizards are not active, we would have expected to find distinctive sign of lizards, such as slough skin and faecal pellets, had lizards been present in reasonable numbers.

3.4 The October/ December 2024 survey focussed on assessment within the northern spoil disposal / staging farmland area and the true left margin of Macgregor Creek (adjacent to the boundary of the Public Conservation Land) – both areas of which are open habitat with low vegetation and high-quality log/rock refuge habitat for day active and sub-basking skinks (and geckos, if any). Methods used were extensive and intensive, and included basking lizard visual searches, timed manual habitat deconstruction searches, use of triple-stacked Artificial Cover Objects (ACO; Onduline sheets), live capture pitfall traps and live capture gees minnow traps (**Figure B2a and B2b; Table B1**). Spotlighting was not undertaken because the suite of methods applied would have detected night-active lizards.

3.5 ACOs were installed in October, 6 weeks prior to use, and were activated and checked three times during December. Baited gees minnow traps and pitfall traps were installed in October and set for up to three nights. Visual search and manual search methods were applied in October and in December. A summary of the methods used is provided in **Table B1**.

Table B1. Methods used, intensity and timing for the October/ December survey at Macgregor Creek and the northern spoil/ laydown areas.

Survey method (numbers, duration)	Macgregor Creek	Spoil/ laydown area
Manual Search (visual basking) – looking for active lizards	Number of areas = 3 October: each area searched by 2 persons for 15 mins (0.5 person hour/ area). Area covered approx. 0.15 ha per area December: each area visually scanned for basking lizards prior to checking ACOs each day	Number of areas = 16 October: each area searched by 2 persons for 15 mins (0.5 person hour/ area). Area covered ranges from 0.13 – 0.18 ha per area December: each area visually scanned for basking lizards prior to checking ACOs each day
Manual Search (cover object active search, rock flipping, log lifting, leaf packs) – looking for slough, faecal pellets, lizards	Number of areas = 1 October: active searching by 2 persons for 10 mins/ per person. Area covered approx. 0.6 ha.	Number of areas = 16 October: active searching by 2 persons for 10 mins/ per person. Area covered ranges from 0.13 – 0.18 ha per area
ACO	Number installed October = 15 as 3 clusters of 5	Number installed October = 80 as 16 clusters of 5

	December: checked 15, 16 and 17 December.	December: checked 15, 16 and 17 December. Signs of flood inundation on some ACOs.
Pitfall	Number installed = 3 Set 15 October, baited and operated/ checked 16, 17 and 18 Oct, then closed down	Number installed = 17 Set 15 October, baited and operated/ checked 16, 17 and 18 Oct, then closed down
Gees minnow	Number installed = 3 Set 15 October, baited and operated/ checked 16, 17 and 18 Oct, then removed	Number installed = 17 Set 15 October, baited and operated/ checked 16, 17 and 18 Oct, then removed
General weather conditions (as measured on site)	October survey – daytime 12-16 degrees, sunny or partly cloudy, light breeze. December survey – daytime 17 – 22 degrees, no cloud or partly cloudy, no wind/ slight breeze.	

4. RMA ECOLOGY SURVEY – RESULTS AND DISCUSSION

4.1 No sign of lizards – either live or dead animals, or slough or faecal pellets – were found across any of the sites surveyed.

4.2 The lack of results from our survey within the spoil disposal /staging and Macgregor Creek margin areas provides a high level of certainty about the absence of lizards. If lizards were present in those areas, the suite of methods that we employed, within the active season for lizards, should have detected them. We can state with a high level of certainty that native lizards are not within those areas. The absence of native lizards from the surveys undertaken is perplexing as habitat is of high quality, although the removal of woody vegetation, and impacts by stock (for the spoil disposal/staging areas), and the seasonal flooding and lack of predator control (for the Macgregor Creek area) probably contribute to the absence of lizards.

4.3 The results of our intensive targeted survey reiterate the conclusion made by Whitaker in 2013 that native lizards in West Coast environments can be at very low numbers, although it is likely or certain that some are present in most habitats.

4.4 Taken together, the Whitaker 2013 survey and the RMA Ecology 2024 survey provide a partial assessment of the complete Scheme footprint. As **Figures B2a and B2b** illustrate, an intensive survey was undertaken within the Scheme footprint at the northern spoil disposal/staging and Macgregor Creek crossing points. In those areas, we are confident that native lizards are absent.

4.5 No, or limited, survey was undertaken south of Macgregor Creek or north of Construction Staging Area 3 (**Table B2**). In those areas – the access road and transmission corridor, Power Station and Headworks areas, and around the Doughboy works – some native lizards may be present and effects on native lizards from clearance of potential habitat in those areas cannot be discounted,

although the number of lizards is expected to be low based on the absence of lizards within superior, nearby, similar, habitat searched by Whitaker in 2013.

4.6 The assumed presence of West Coast green gecko and forest gecko within suitable habitat south of Macgregor Creek and in scrubland around the Doughboy means that, if they are present, the removal of vegetation and potential habitat during construction of the Scheme has the potential to cause incidental injury or death to native lizards. The level of effect, if any, will be very low because these species are expected to be at low densities throughout parts of the Scheme footprint and are widely distributed across this part of the West Coast, or across a wider geographic distribution.

4.7 The substantive environmental effects report for lizards (Sections 5 and 6 and Table 1) provides an assessment of potential effects and lays out proposed mitigations that will be implemented for this project in order to avoid, to the extent practicably feasible, the incidental injury or death of native lizards.

4.8 Assuming that the mitigations listed in Section 7 of that report are implemented, we expect that the potential for adverse effects on lizards will be low, and that the residual adverse effects after mitigation is implemented will be less than minor.

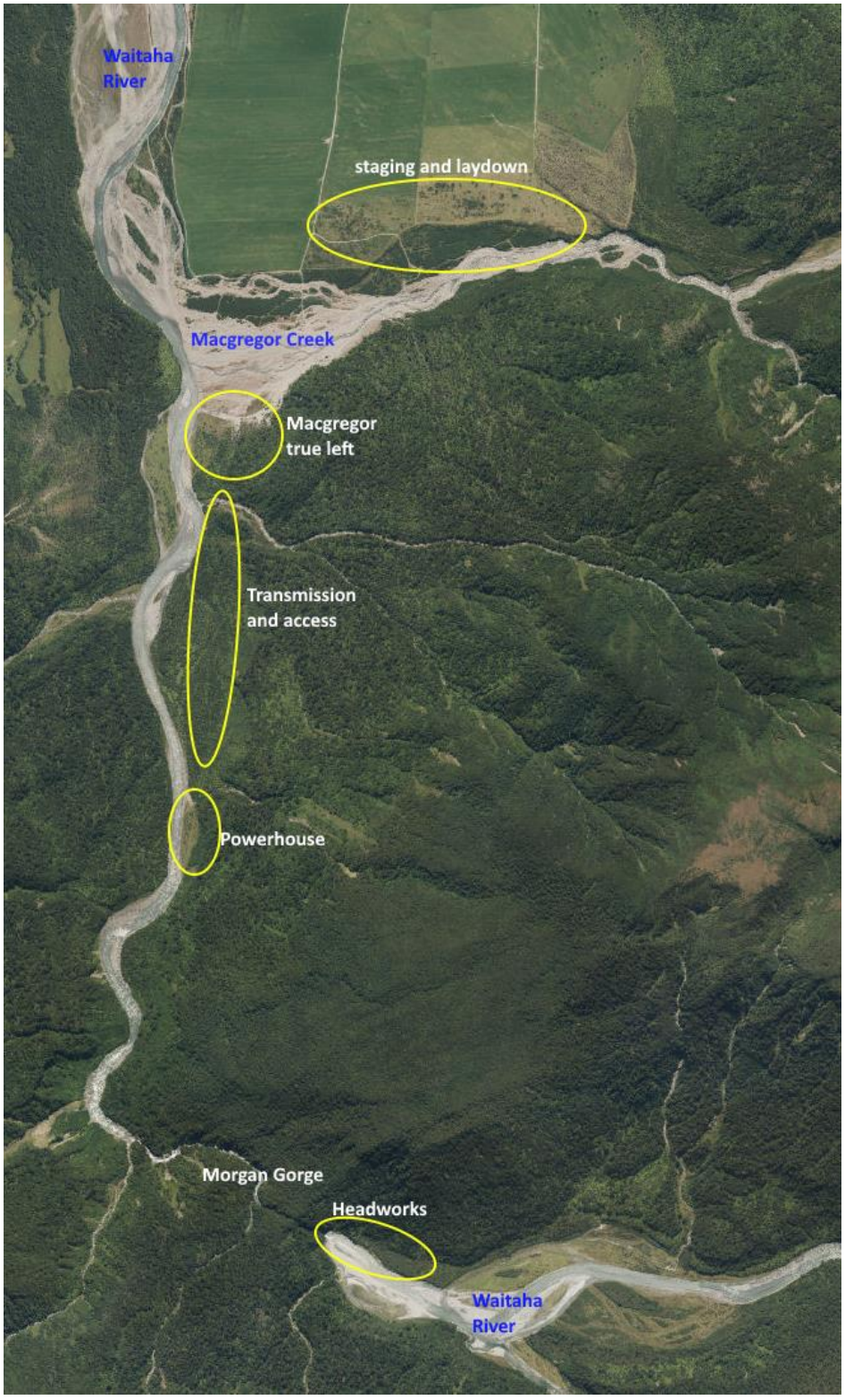
4.9 **Table B2.** Application of lizard survey methods across the Scheme footprint.

Scheme component	Survey effort
Headworks – road and laydown areas (dense shrubland and river margin)	None (Whitaker 2013 manual and spotlight search at nearby similar sites)
Power Station – road, Power Station, discharge (open terrace grassland and sparse shrubland, mature tree edge at foot-slope)	Manual search August 2024
Access road and transmission line corridor through to Macgregor Creek (regenerating kamahi/ mixed hardwood forest and shrubland)	None
Macgregor Creek margins (alluvial cobble with low adventive weeds and grasses)	Intensive visual basking, timed cover object search, pitfalls, gee minnows, October 2024. ACO checks December 2024.
Spoil storage and laydown area (true right Macgregor Creek; rough pasture grassland over terrace gravels).	Intensive visual basking, timed cover object search, pitfalls, gee minnows, during October 2024. ACO checks December 2024.

4.10	Doughboy access road upgrade and transmission route	4.11	None

APPENDIX D – SITE HABITAT PHOTOS

Site photos below are representative photos of each of the principal potential habitats for lizards within each part of the Project Site, and are grouped according to the yellow circled areas on the map below.



Area 1 – Headworks

Plates 1-4. Regenerating mixed hardwood shrublands at proposed Construction Staging Area 1 on the terrace above the true right of the river at Morgan Gorge. Shrublands are diverse, divaricating, dense and up to 3-4 m tall. These offer potential habitat for West Coast green gecko and forest gecko.

Plates 5-8. The margins of the true right terrace where the access road from the Headworks to Construction Staging Area 1 will be located. Forest structure is older with taller, more open canopies, and greater amounts of dead wood and thicker ground cover. This offers potential habitat for forest gecko and West Coast green gecko and grass skink on the edges where shrubs are thicker and light is more intense. The rock face with ferns (bottom left) is the location of the portal opening.

Area 2 – Power Station

Plates 9-12. The low alluvial terrace at the Power Station Site comprises of deep river gravels with large patches of low toetoe and sparse divaricating shrubland cover. This location is of good quality habitat for sun-loving skinks, but is poor quality habitat for West Coast gecko and forest gecko. Large items of wood are rare, stone piles are locally common. Manual searching through all of these habitat types yielded no lizards, faecal pellets or sloughs.




Plates 13-16. Vegetation communities at the Power Station Site are evenly divided between structural complex toetoe and sparse shrubland, and the more open, shorter, grazed turfs with occasional tree fern and sapling hardwoods. These open areas offer poor habitat for skinks and geckos as they lack refuges. Riparian margins offer thick short turfs over boulder fields. Manual searching through all of these habitat types yielded no lizards, faecal pellets or sloughs.

Area 3 – Transmission route and access road

Plates 17-20. The southern end of the access road and transmission line corridor has regenerating kamahi-free fern forest up to 8 m tall. Canopy closure is complete. The understorey has been significantly impacted by browsing animals. Habitat quality is moderate for forest gecko.

Plates 21-24. The mid and northern end of the access road and transmission line corridor has younger regenerating hardwood shrublands, with occasional mature emergent trees. At Granite Creek (bottom left), the margins support thick seral and sapling tree species and offer refuge and basking opportunities for skinks. Shrubland offer habitat for West Coast Green and forest gecko.

Area 4 – True left crossing of Macgregor Creek

Plates 25-28. True left of Macgregor Creek (where access road and transmission line route from the Power Station exit to the Creek) showing margins strewn with boulders, cobble banks and large woody materials (root wads, tree trunks). The margins of the Creek grade into short weedy and hardwood communities and thereafter taller hardwood shrubland communities with the occasional dead standing or live relict mature tree. The combination of stable boulders, vegetation, open, closed, low, taller and dense communities provide potential habitats for ground-dwelling skinks, West Coast green and forest geckos.

Plates 28-31. True left of Macgregor Creek (where transmission and access route from the Power Station traverses the Creek margins before heading across the Creek to the true right bank) showing margins strewn with boulders, cobble banks and large woody materials (root wads, tree trunks).

Area 5 – Farmland staging and spoil stockpile area

Plates 32-35. True right of Macgregor Creek showing outwash fan colonised by recently established tutu (dominant) with seedling hardwoods (top left). Older terraces set back form the Creek margins form part of the 30-hectare spoil disposal and Construction Staging Area 3, which is over rough pasture and boulder fields with gorse and occasional native shrubs.

Plates 36-39. Plates 32-35. True right of Macgregor Creek showing boulder terraces set back from the Creek margins that form part of the 30-hectare spoil disposal and staging area and which are colonised by pasture grasses and in some areas, dense gorse. Open boulder fields, logs and farm debris offer opportunities for ground-dwelling skinks within this 30-hectare spoil disposal and staging area